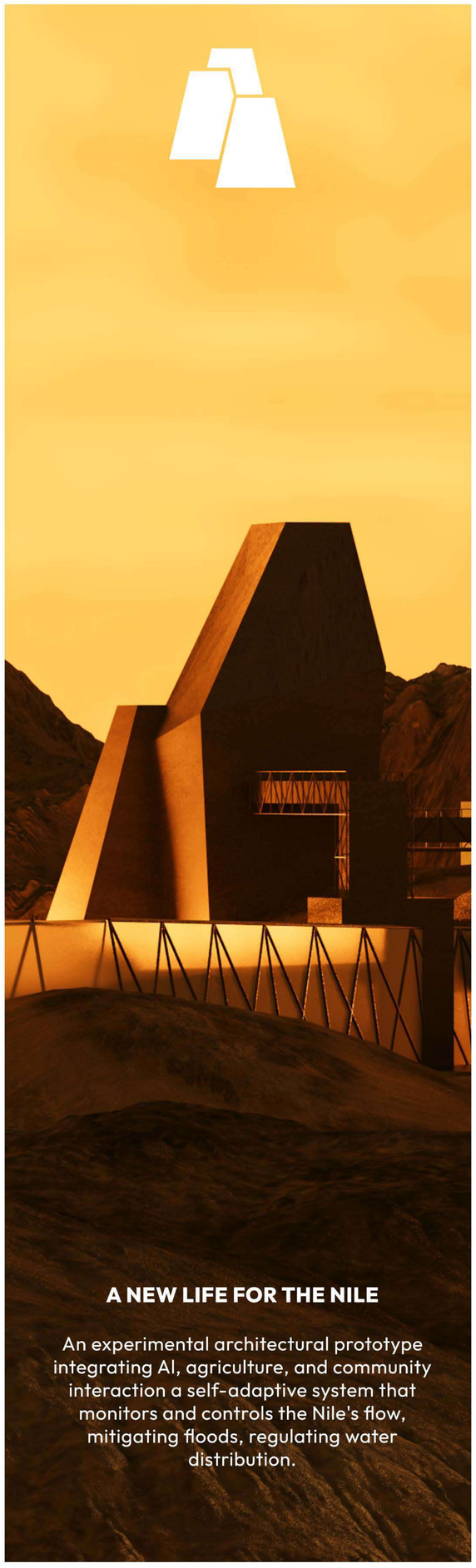


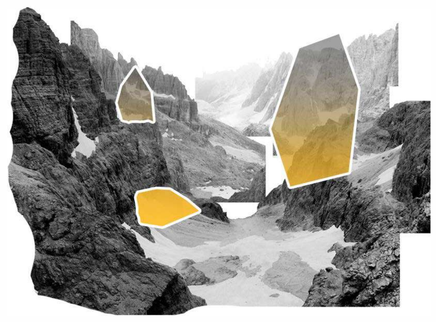
A NEW LIFE FOR THE NILE

An experimental architectural prototype integrating AI, agriculture, and community interaction a self-adaptive system that monitors and controls the Nile's flow, mitigating floods, regulating water distribution.

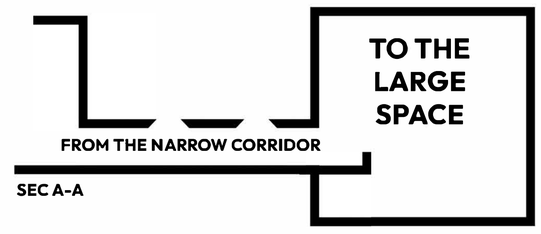
RENILE

CONCEPT

The project unfolds as a **dialogue between architecture and the mountain**.
Through a **resilient response to environmental forces**, form and structure do not confront the landscape; they arise from it. The **masses** appear **as geological continuations, born from the mountain's logic**, carrying its layers, forces, and memory into built form.

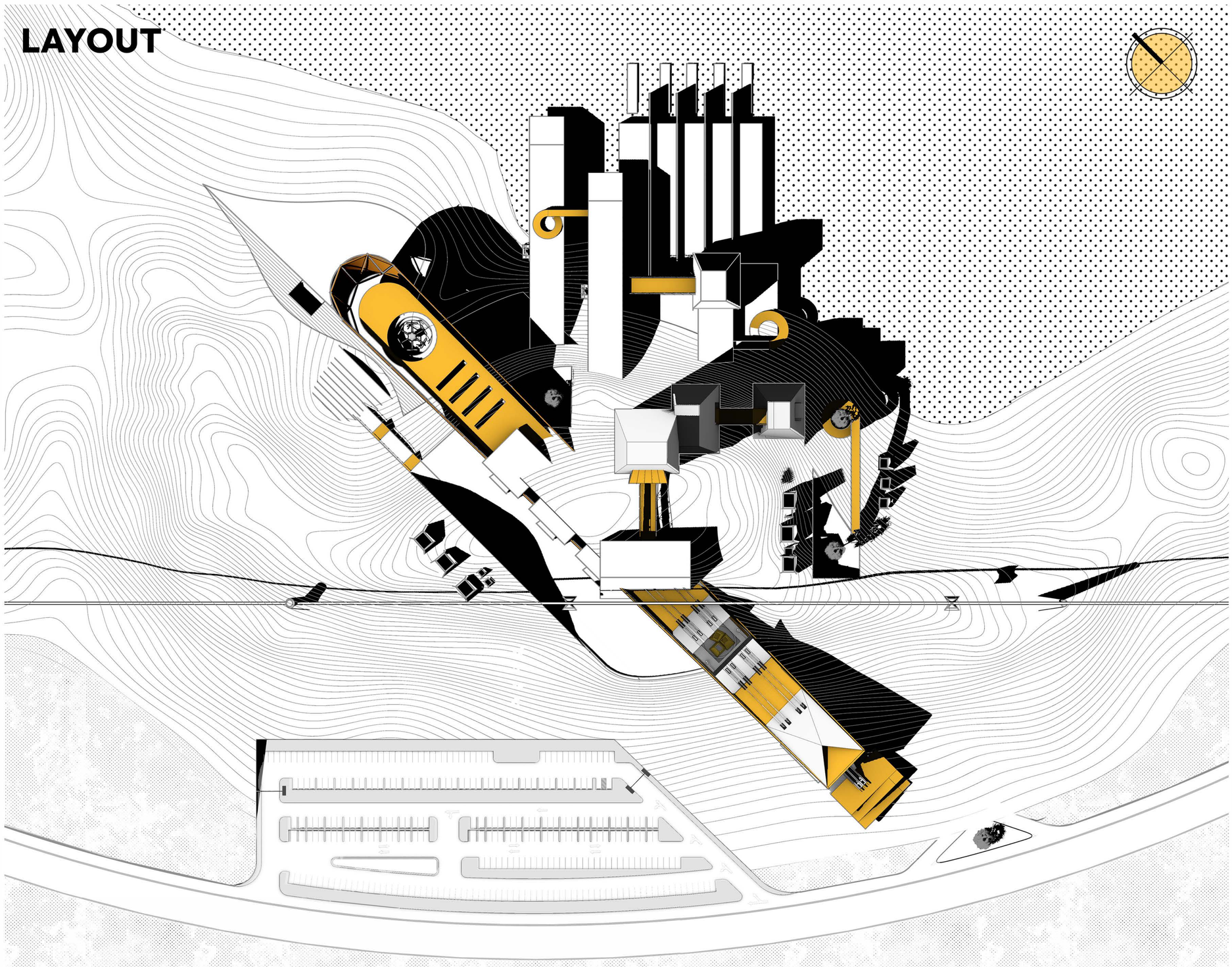


STUDIO THEME



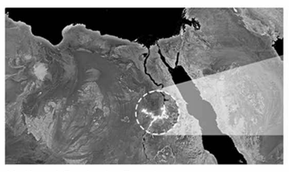
A journey from darkness to light symbolizing humanity's evolution from Nile dependence to AI-powered control.

LAYOUT

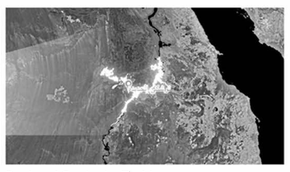


SITE ANALYSIS

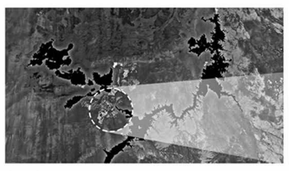
1.LOCATION

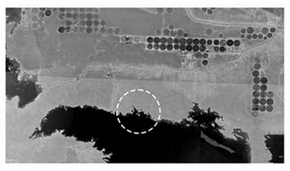


National Context – Egypt
Showing the location of Toshko in relation to the Nile River and the main urban centers in Egypt.



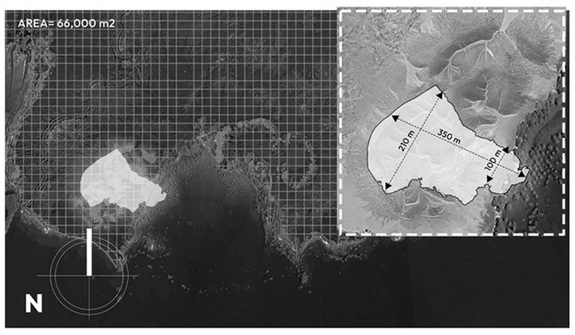
Regional Context – Tushka
Illustrating the relationship between Toshka Lakes, the New Valley, and the Nile.

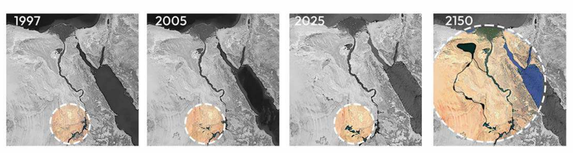




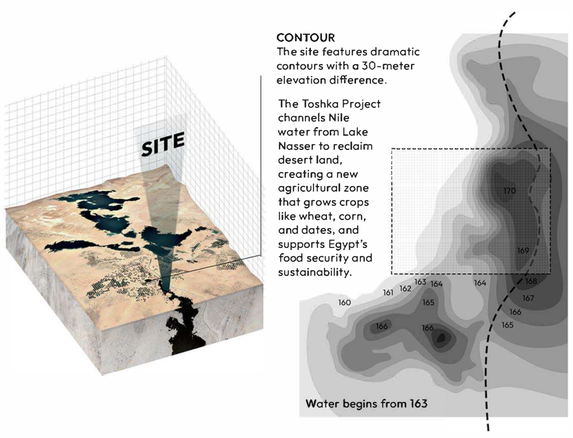
Site Context – Project
Showing the location of Toshka in relation to the Nile River and the main urban centers in Egypt.

2.DIMS. & SETBACKS





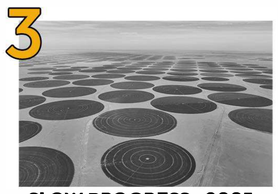
3.SITE CHARACTERISTICS



PROBLEM DEFINITION

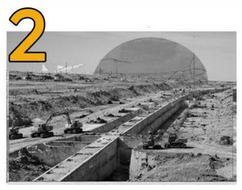
REVIVING THE OLD DREAM

1
NATIONAL VISION – 1997
National mega-project announced.



3
SLOW PROGRESS– 2005
Development fell behind expectations.

5
CANAL COMPLETED– 2003
Government relaunched and expanded the project.



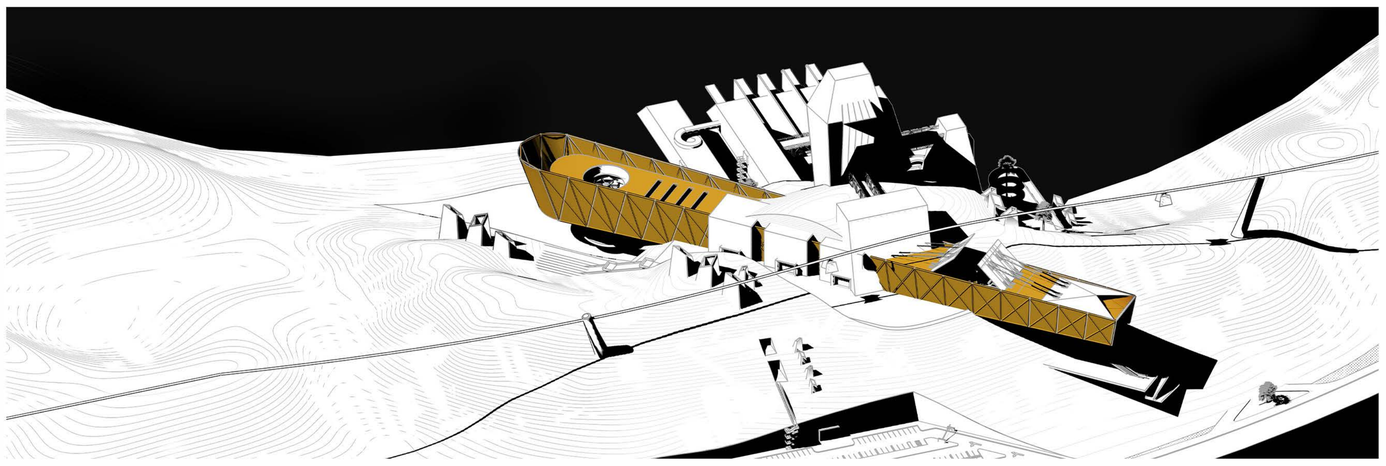
2
CANAL COMPLETED– 2003
Water reached Toshka through the Sheikh Zayed Canal.

4
PROJECT FAILURE– 2015
Widely considered an unsuccessful national project.

6
THE NEW ERA– 2150
Smart Nile systems • Sustainability • Food Security

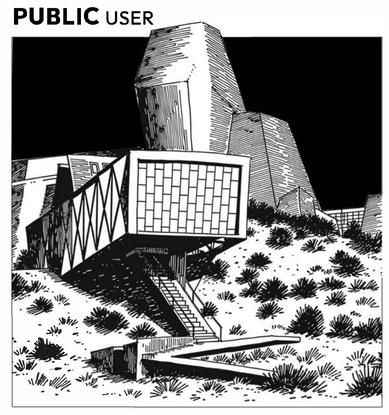
Despite its enormous potential, Tushka has struggled for decades with fragmented **development, inefficient water management, and limited adaptability to changing environmental conditions**. The absence of an intelligent system capable of monitoring, predicting, and **responding to natural forces** has prevented the project from reaching its full potential, leaving vast natural resources underutilized and limiting long-term resilience.

More than a research center, the project serves as the "Nile Brain"an AI-powered hub that monitors and optimizes water flow across dams, canals, and irrigation networks. As a living prototype, it tests and validates innovative environmental solutions before replicating them across future Toshka developments.

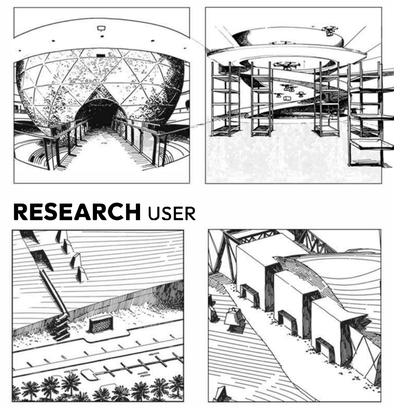


USER SCENARIO

PUBLIC USER



RESEARCH USER



THE DIALOGUE

The project was designed to merge with the surrounding nature rather than stand apart from it. The building form is inspired by the geometry of the mountains, using sharp angles and fragmented masses to create harmony with the landscape.

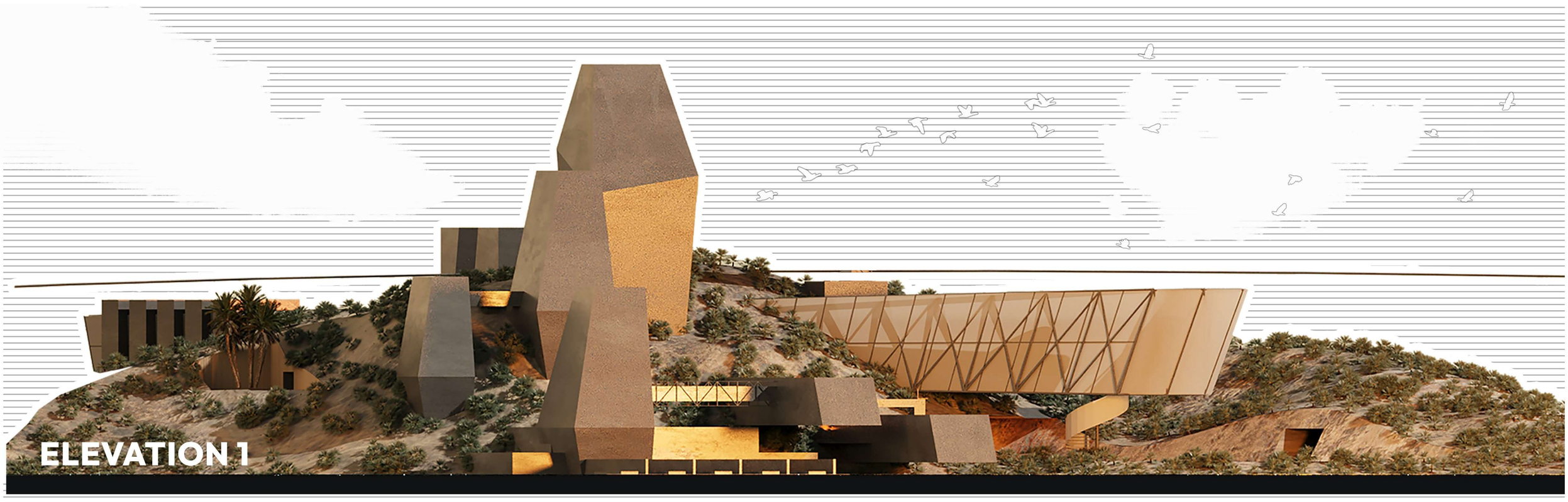
MASTERPLAN

LEGEND

1 ENTRANCE
2 CAFE
3 TICKET PASSAGE
4 EXHIBITION 1
5 EXHIBITION 2
6 EXHIBITION 3
7 EXHIBITION 4
8 FARMING
9 RARE PLANTS
10 DRONE LANDING
11 RESEARCH HUB
12 RESEARCH TOWER
13 SMALL INN
14 PLANITATION SUPPLY

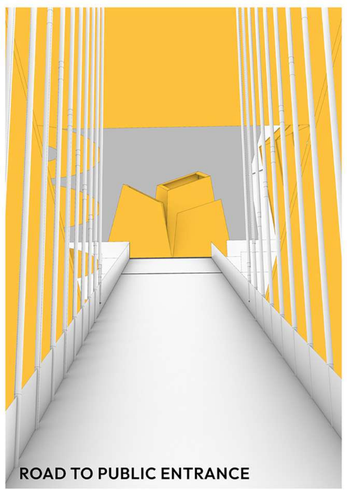
SCALE 1:400

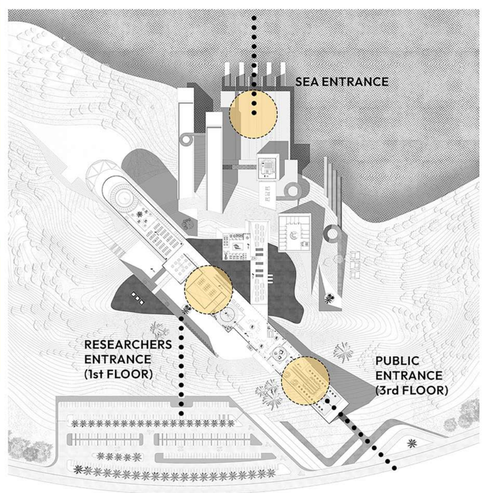
NOTE: between each contour line and the other the distance equals 1m.



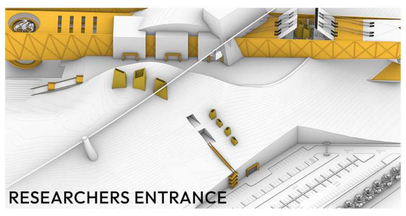
ELEVATION 1

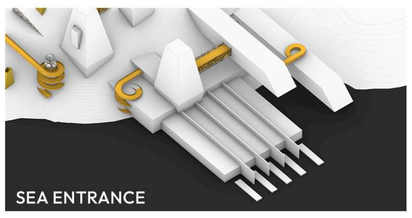
ENTRANCE STUDY



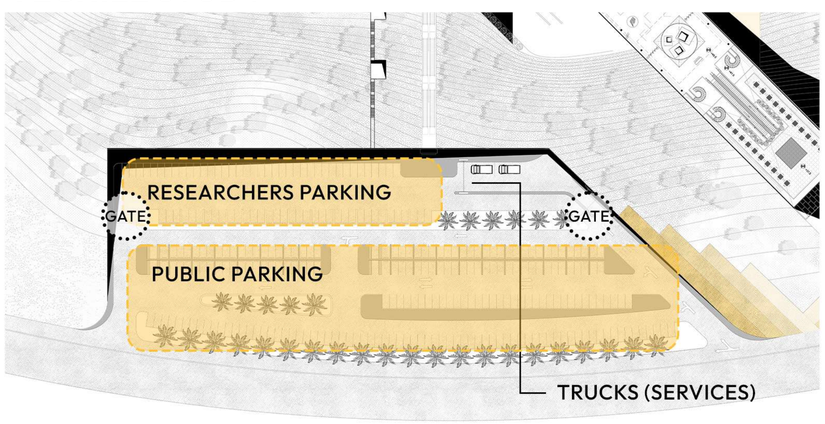


The project orchestrates a **layered sequence of entrances**, each responding to a different user group and level. From the public approach to the elevated entry, the journey is framed by vertical elements that guide movement and gradually reveal the architecture, while maintaining a clear separation between public, researchers, and sea access.

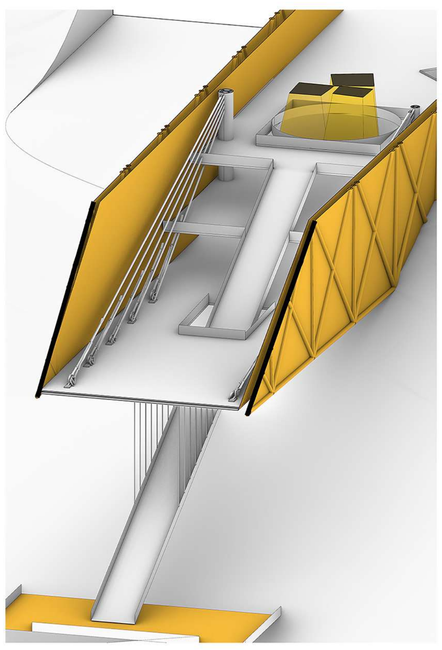


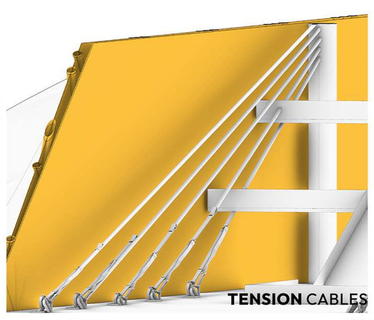


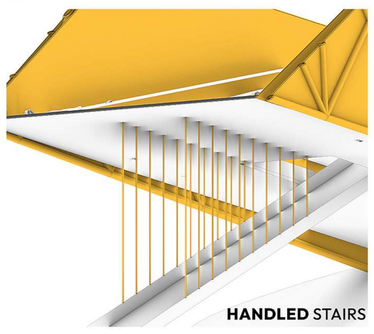
VECHILE STUDY



STRUCTURE STUDY







Tension cables are used to support a **70m cantilever**, reducing bending moments and transferring loads to rear anchorage points for a more efficient structural system.

PLANITATION STUDY
FOR DESERT – RIVERSIDE LANDSCAPE

OASIS BETWEEN DESERT & NILE

SUN · LOW WATER · DROUGHT TOLERANT · SALT TOLERANT

NO.	PLANT NAME (SCIENTIFIC NAME)	TYPE	MATURE SIZE (H x W)	CANOPY RADIUS	ROOT ZONE RADIUS (MIN.)	PLANTING DISTANCE (CENTER TO CENTER)	WATER NEED	SUN EXPOSURE	REMARKS
1	CACTUS (Prickly Pear) (Opuntia ficus-indica)	SUCCULENT	1.5 – 3 m (5 – 10 ft)	1.0 – 1.5 m (3 – 5 ft)	1.5 m (5 ft)	2.5 – 3.0 m (8 – 10 ft)	VERY LOW	FULL SUN	EXTREMELY DROUGHT TOLERANT
2	AGAVE (Agave americana)	SUCCULENT	1.0 – 1.5 m (3 – 5 ft) x 1.5 – 2.0 m (5 – 6.5 ft)	1.0 – 1.25 m (3 – 4 ft)	1.5 m (5 ft)	2.0 – 2.5 m (6.5 – 8 ft)	VERY LOW	FULL SUN	SCULPTURAL FORM
3	DATE PALM (Phoenix dactylifera)	TREE	15 – 25 m (50 – 82 ft) x 6 – 8 m (20 – 26 ft)	3 – 4 m (10 – 13 ft)	4 – 6 m (13 – 20 ft)	7 – 9 m (23 – 30 ft)	LOW	FULL SUN	NATIVE ICONIC TREE
4	LAVENDER (Lavandula spp.)	SHRUB	0.6 – 1.0 m (2 – 3.5 ft) x 0.6 – 1.0 m (2 – 3.5 ft)	0.5 m (1.5 ft)	0.6 – 0.8 m (2 – 2.5 ft)	0.8 – 1.0 m (2.5 – 3.5 ft)	LOW	FULL SUN	FRAGRANT POLLINATOR FRIENDLY
5	REED (Phragmites australis)	AQUATIC GRASS	2 – 4 m (6.5 – 13 ft) x CLUMP 1 – 2 m (3 – 6.5 ft)	1 m (3.5 ft)	1.0 – 1.5 m (3.5 – 5 ft)	1.5 – 2.0 m (5 – 6.5 ft)	HIGH	FULL SUN	WATER EDGE PLANT

ROOT ZONE GUIDELINES

Root zone radius is the minimum area required around the plant for healthy root growth.

GENERAL NOTES

- Plant in the cooler season (Oct – Feb).
- Use organic mulch layer (5 – 8 cm) to reduce evaporation.
- Provide drip irrigation for water efficiency.
- Avoid root barrier unless near structures.
- Group plants with similar water needs.
- Ensure good drainage but retain moisture.

PLANTING DISTANCE EXPLAINED

Distance (center to center) ensures healthy root development, proper canopy growth, and good air circulation.

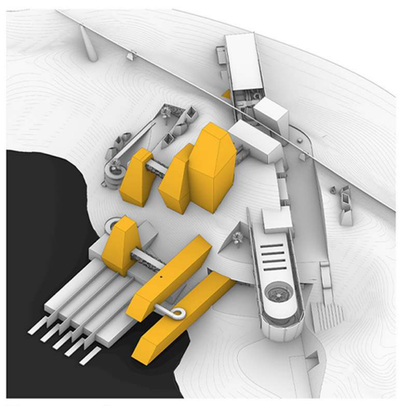
FIRST FLOOR PLAN

LEGEND

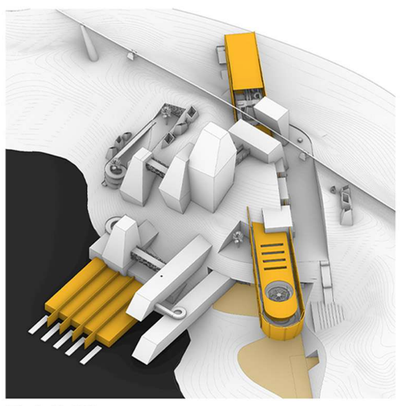
1 KITCHEN
2 STORAGE
3 ADMIN
4 VIP ENTRANCE
5 EXHIBITION 2
6 EXHIBITION 3
7 EXHIBITION 4
8 FARMING
9 RARE PLANTS
10 DRONE LANDING
11 WATER FILTERATION BY ROBOTS
12 RESEARCH TOWER
13 SMALL INN
14 MOVABLE SERVICE UNIT
15 PLANITATION SUPPLY

SCALE 1:600

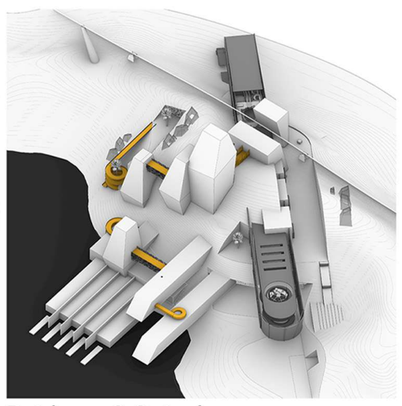
MASS STUDY



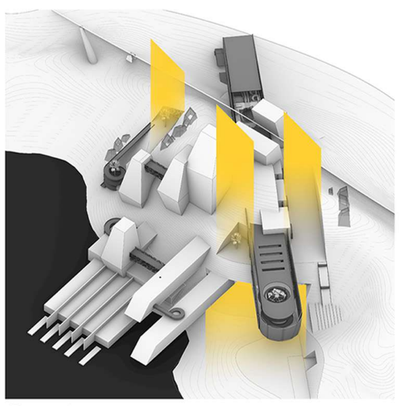
Research



Exhibitions



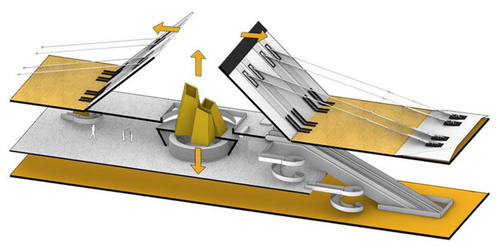
Bridgea & Spirals

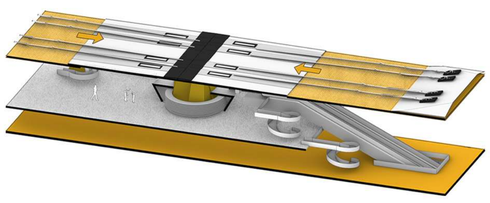


Courts

SEA LEVEL PLAN
SCALE 1:600

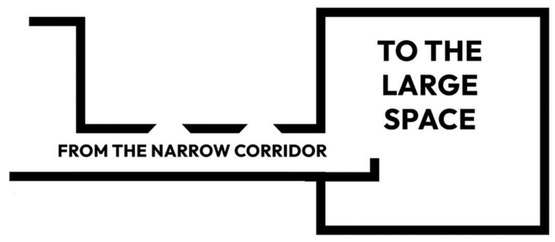
LIVING LANTERNS
By night, the project sheds its solid form and becomes **a collection of floating lanterns**. Each illuminated volume acts as a beacon, gently glowing against the dark landscape, while its reflection doubles the light across the calm water creating a serene dialogue between architecture and nature.





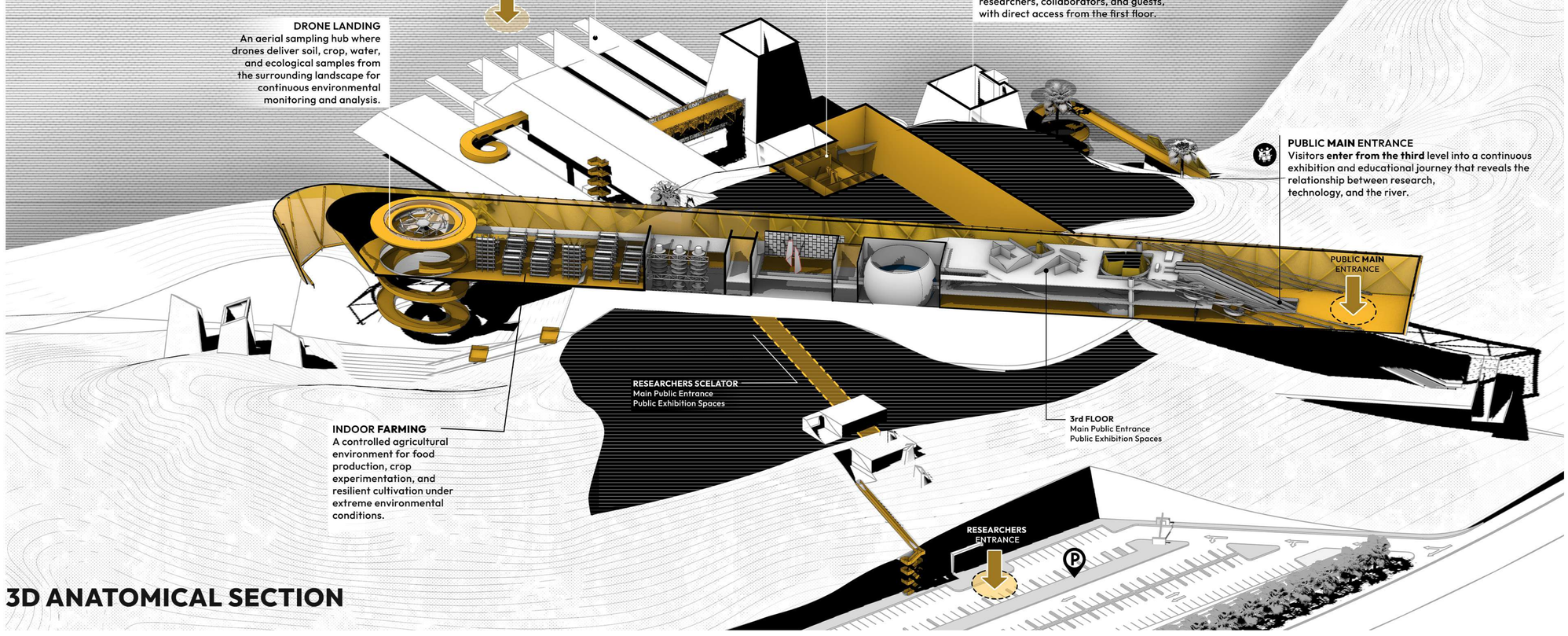
RESPONSIVE ROOF
A kinetic roof system that transitions between open and closed configurations to regulate environmental conditions and spatial experience.

STUDIO THEME
A journey from darkness to light.

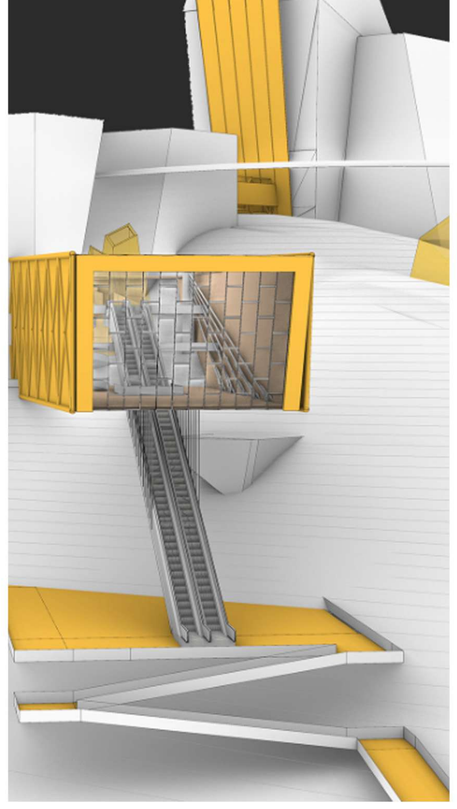


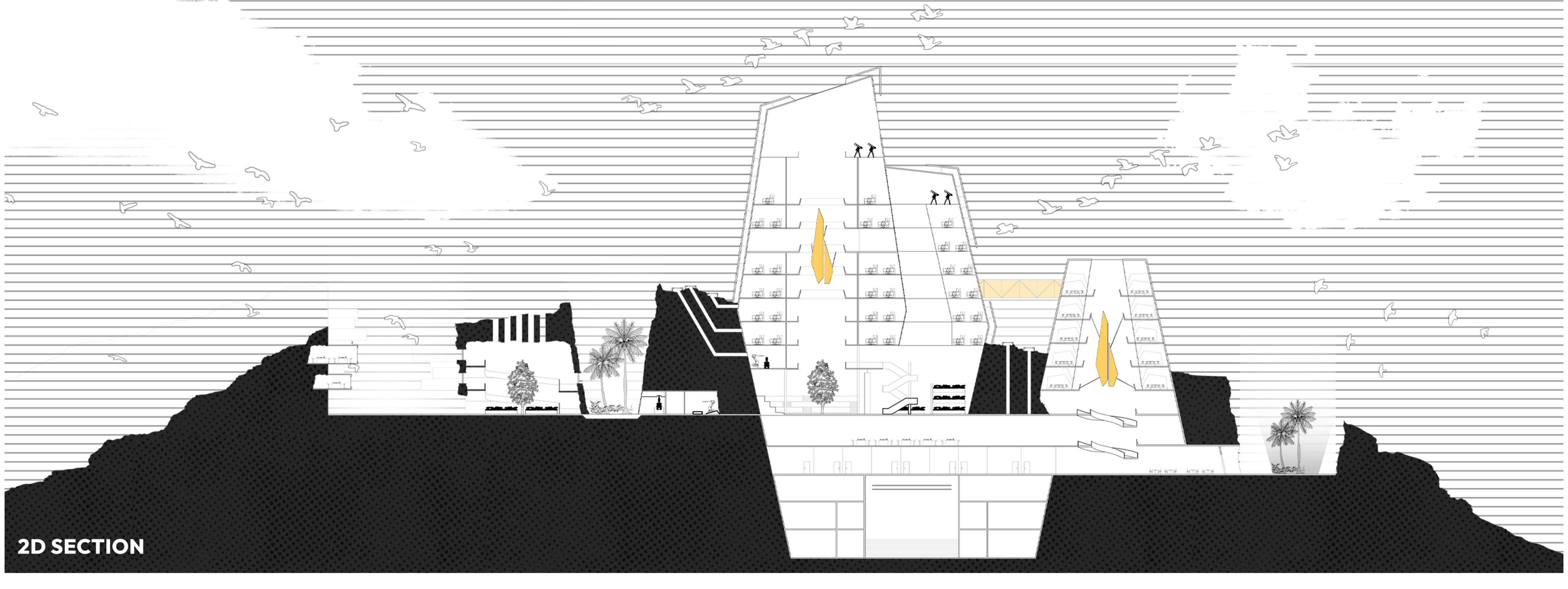
FROM DARKNESS TO LIGHT
The project is based on the **element of surprise as a core spatial concept**.
Architecture here is not revealed all at once, but experienced through a sequence of controlled moments.
Users move from dark, narrow spaces into a sudden triple-height, light-filled volume, creating a moment of spatial shock.

THE ELEMENT OF SURPRISE
Inspired by mountain caves, the project reveals space gradually moving from darkness into light, creating a moment of discovery.

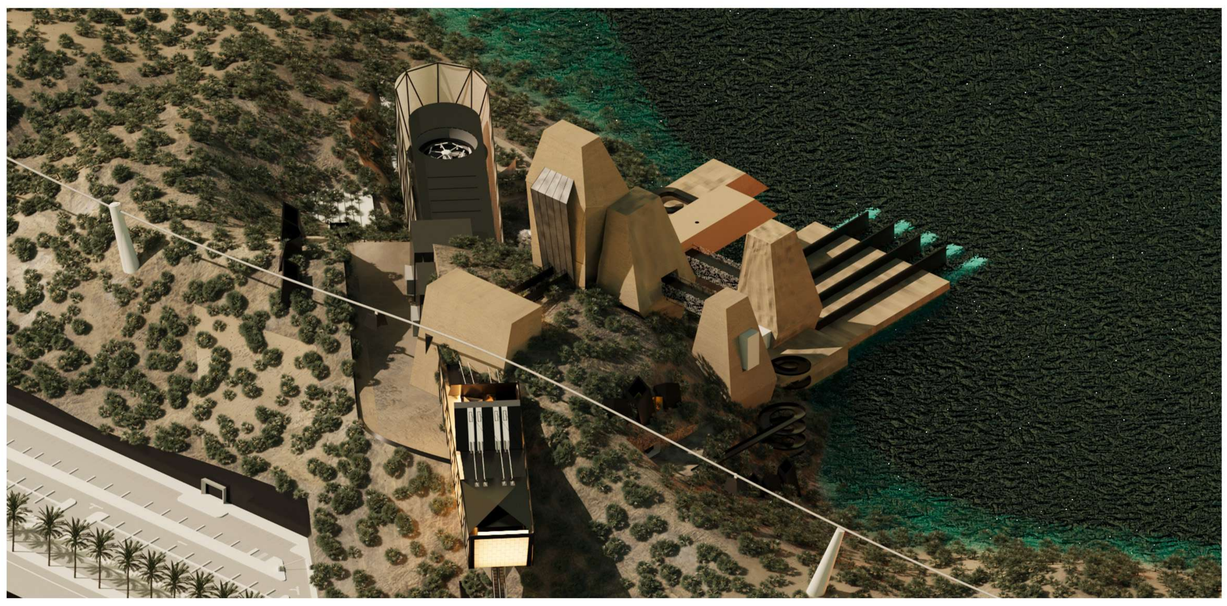


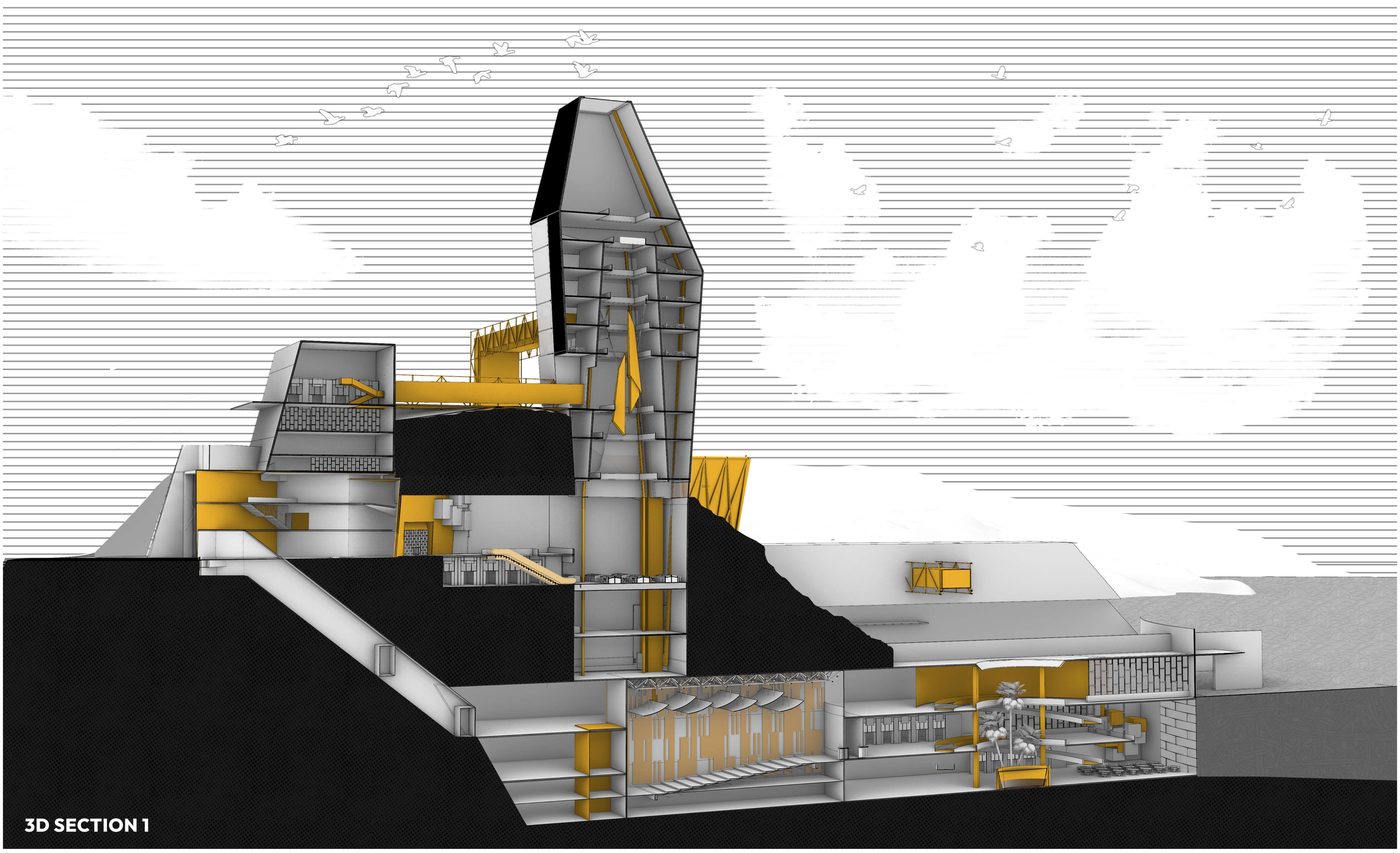
3D ANATOMICAL SECTION



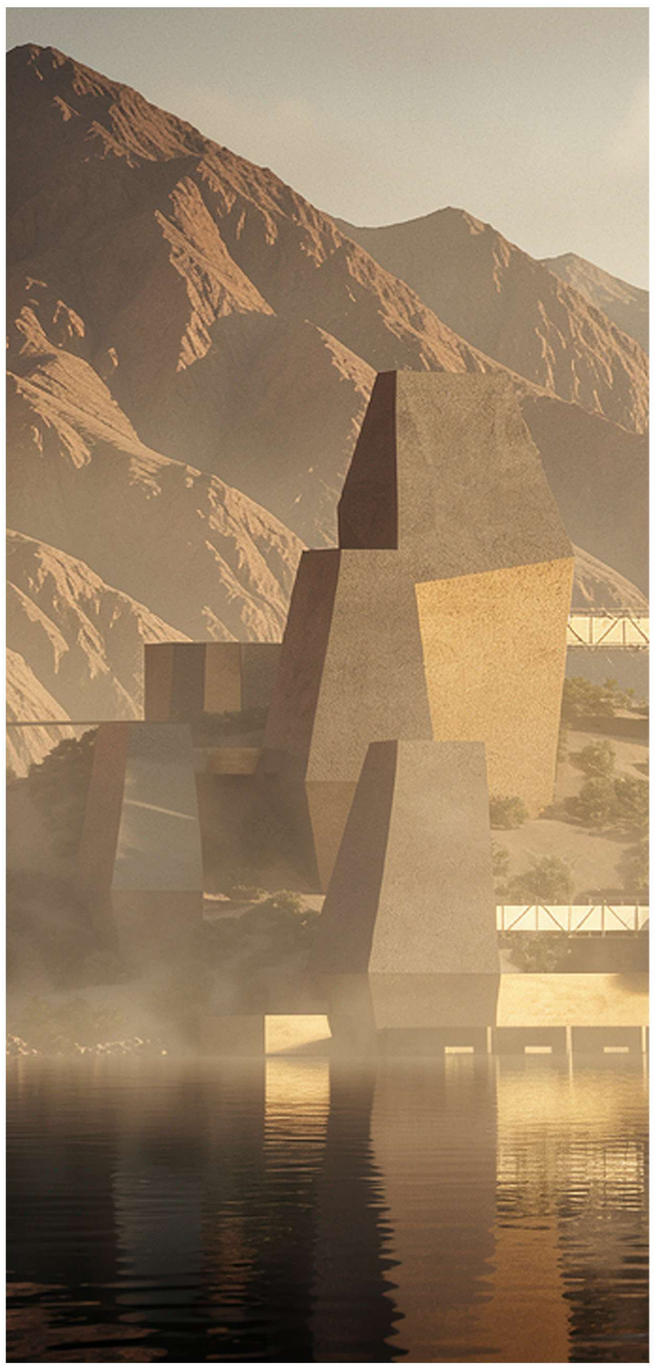


2D SECTION

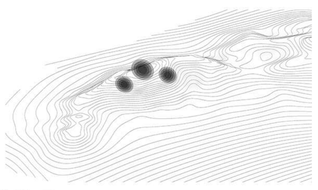




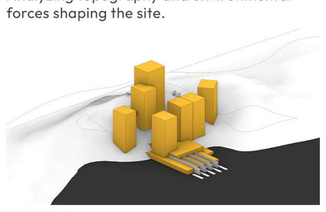
3D SECTION 1



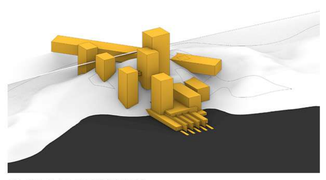
FORM GENERATION



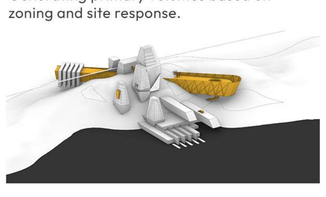
1) Site Forces
Analyzing topography and environmental forces shaping the site.



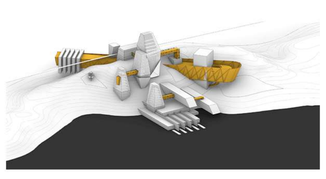
2)3D Zoning
Organizing functions vertically and horizontally across the terrain.



3) INTIAL MASSING
Generating primary volumes based on zoning and site response.

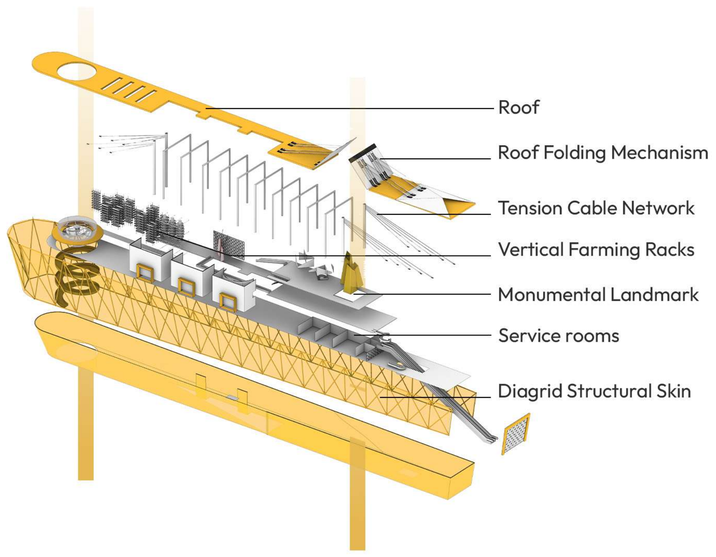


4) CONCEPT LAYER
Applying the conceptual theme to articulate and sculpt the masses



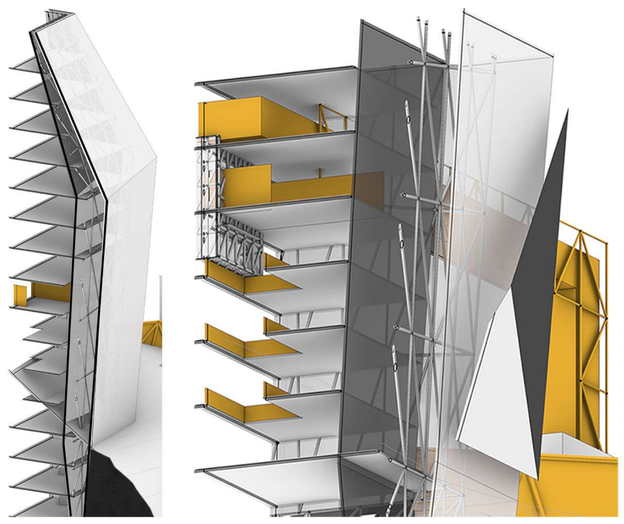
5) FINAL FORM
Connecting volumes through bridges to achieve a unified final form

EXPLODED 3D AXONOMETRY

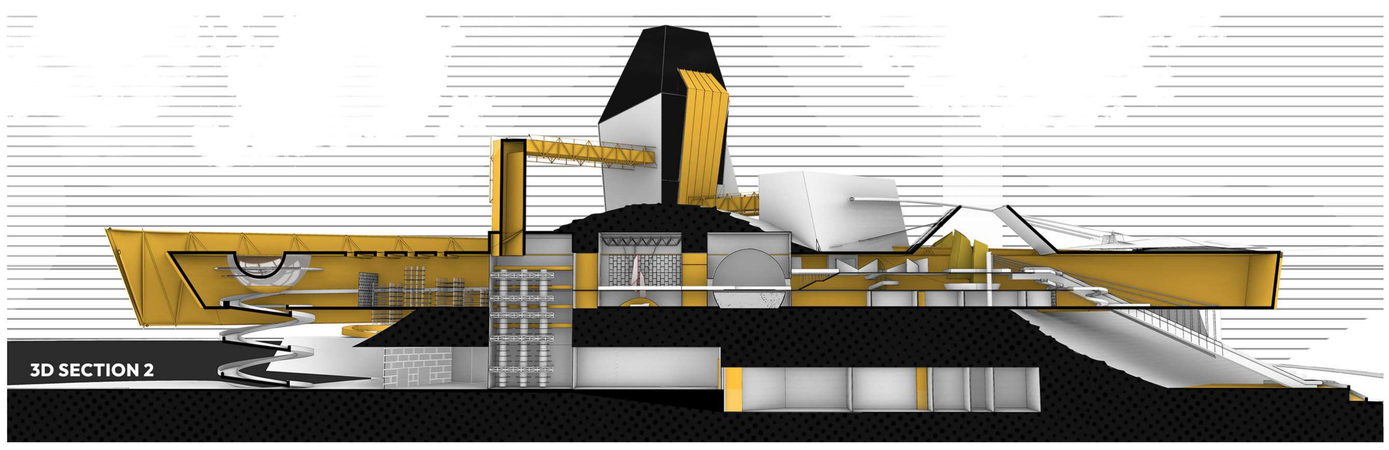


The exploded axonometric illustrates the building's layered systems, revealing how structure, technology, and program integrate into a cohesive architectural composition.

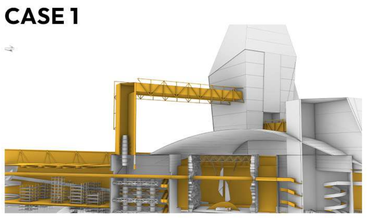
WALL SECTION



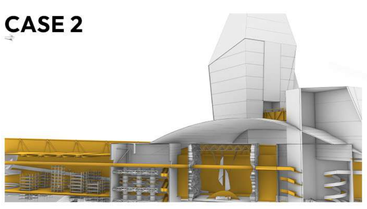
A multi-layered smart façade system integrating energy-efficient glazing with an adaptive structural frame, complemented by dynamic light and privacy screens to achieve optimal environmental performance and visual comfort.



CASE 1

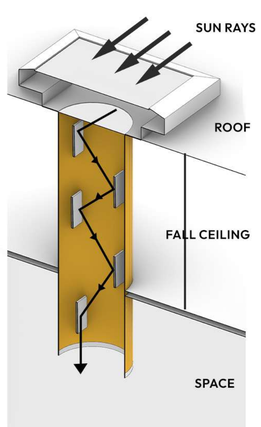


CASE 2



The L-shaped detail is designed as a modular element that can be automatically assembled and disassembled, allowing easy maintenance without manual intervention.

LIGHT TUBE



TO THE STATUE

A futuristic golden interior where twin escalators lead to a monumental abstract sculpture. Dramatic geometry, spiral ramps, and expansive glass surfaces create a powerful sense of scale, light, and innovation.